

EXPRESS MAIL LABEL EE438857006US  
Serial No. 09/029807

Rec'd POT/PO 29 MAY 1998

PATENT  
RCA 88,391

*HB*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : HAROLD BLATTER, MICHAEL FRANCIS KVINTUS, JR.,  
MICHAEL JOSEPH McLANE  
Serial No. : 09/029,807  
Int'l Appln. No. : PCT/US96/14733  
Int'l Filing Date : 13 September 1996 (13.09.96)  
For : UPGRADABLE ON-SCREEN DISPLAY SYSTEM  
ATTENTION: PCT RECEIVING OFFICE

FILING OF MISSING PARTS OF APPLICATION -  
RESPONSE TO NOTICE TO FILE MISSING PARTS

Hon. Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

In response to the Notice to File Missing Parts of Application Under 35 U.S.C.  
371, mailed 04 May 1998, and relating to the above-identified application Serial No.  
09/029,807, Applicants hereby submit the following:

- 1) An executed Declaration and Powers of Attorney.
- 2) An executed Assignment with Cover Page.
- 3) A surcharge of \$130.00 required under 37 CFR 1.16(e) for filing the  
Declaration and basic filing fee on a date later than the filing date of the application.
- 4) An assignment recordation fee of \$40.00.

Please charge the cost of the surcharge and assignment recordation fee to  
Deposit Account No. 07-0832. Please charge any additional fees and credit any  
overpayments to Deposit Account No. 07-0832. A duplicate copy of this letter is enclosed for  
use in charging the deposit account.

Respectfully submitted,  
Harold Blatter et al.

*Francis A. Davenport*

Francis A. Davenport,  
Registration No. 36,316  
609/734-9864

RECEIVED MAY 29 1998

11 MAY 1998

GE & RCA Licensing Management Operation, Inc.  
Patent Operation  
PO Box 5312  
Princeton, NJ 08543-5312

DATE: 29 May 1998

(Letter In Duplicate)

09/029807

Reed PCT/PTO 09 MAR 1998

FORM PTO-1399 (REV 10-94)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371				RCA 88391
INTERNATIONAL APPLICATION NO. PCT/US96/14733		INTERNATIONAL FILING DATE 13 September 1996 (13.09.96)	PRIORITY DATE CLAIMED (15.09.95) 15 September 1995 14 February 1996 (14.02.96)	
TITLE OF INVENTION UPGRADABLE ON-SCREEN DISPLAY SYSTEM				
APPLICANT(S) FOR DO/EO/US n Harold Blatter, Michael Francis Kvintus Jr., Michael Joseph McLane				
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:				
<p>1. <input checked="" type="checkbox"/> This is a <b>FIRST</b> submission of items concerning a filing under 35 U.S.C. 371.</p> <p>2. <input type="checkbox"/> This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U.S.C. 371.</p> <p>3. <input checked="" type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1)</p> <p>4. <input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date</p> <p>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2))</p> <p>a. <input type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau).</p> <p>b. <input type="checkbox"/> has been transmitted by the International Bureau.</p> <p>c. <input checked="" type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US)</p> <p>6. <input type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)).</p> <p>7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))</p> <p>a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau).</p> <p>b. <input type="checkbox"/> have been transmitted by the International Bureau.</p> <p>c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</p> <p>d. <input checked="" type="checkbox"/> have not been made and will not be made.</p> <p>8. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</p> <p>9. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).</p> <p>10. <input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</p> <p>Items 11. to 16. below concern document(s) or information included:</p> <p>11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98. with references attached</p> <p>12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included</p> <p>13. <input type="checkbox"/> A <b>FIRST</b> preliminary amendment.</p> <p><input type="checkbox"/> A <b>SECOND</b> or <b>SUBSEQUENT</b> preliminary amendment.</p> <p>14. <input type="checkbox"/> A substitute specification.</p> <p>15. <input type="checkbox"/> A change of power of attorney and/or address letter.</p> <p>16. <input type="checkbox"/> Other items or information:</p>				
EE121623715US		CERTIFICATE OF MAILING UNDER 37 CFR 1.10 9 March 1998		
"Express Mail" mailing no.		Date of Deposit		
I hereby certify that this application is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.				
Davida Fornarotto		Davida Fornarotto		
Typed or printed name of person mailing application		Signature of person mailing application		

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)		INTERNATIONAL APPLICATION NO.		ATTORNEY'S DOCKET NUMBER	
		PCT/US96/14733		RCA 88391	
17 <input checked="" type="checkbox"/> The following fees are submitted:				CALCULATIONS PTO USE ONLY	
<b>BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)):</b>					
Search Report has been prepared by the EPO or JPO.....\$930.00					
International preliminary examination fee paid to USPTO (37 CFR 1.482).....\$720.00					
No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)).. \$790.00					
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO..... \$1070.00					
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4)..... \$98.00					
<b>ENTER APPROPRIATE BASIC FEE AMOUNT =</b>				\$ 1070.00	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	10 -20 =	0	X \$22.00	\$	
Independent claims	3 -3 =	0	X \$82.00	\$	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$270.00		
<b>TOTAL OF ABOVE CALCULATIONS =</b>				\$ 1070.00	
Reduction by 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28).				\$	
<b>SUBTOTAL =</b>				\$ 1070.00	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				+	
<b>TOTAL NATIONAL FEE =</b>				\$ 1070.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +				\$	
<b>TOTAL FEES ENCLOSED =</b>				\$ 1070.00	
				Amount to be:	
				refunded \$	
				charged \$1070.00	
a. <input type="checkbox"/> A check in the amount of \$ _____ to cover the above fees is enclosed.					
b. <input checked="" type="checkbox"/> Please charge my Deposit Account No. <u>07-0832</u> in the amount of \$ <u>1070.00</u> to cover the above fees. A duplicate copy of this sheet is enclosed.					
c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>07-0832</u> . A duplicate copy of this sheet is enclosed.					
NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.					
SEND ALL CORRESPONDENCE TO				SIGNATURE	
Mr. Joseph S. Tripoli				<u>Francis A. Davenport</u>	
GE & RCA Licensing Management Operation, Inc.				NAME	
PO Box 5312				36,316	
Two Independence Way				REGISTRATION NUMBER	
Princeton, New Jersey 08543				55:2 11 MAR 98	
DOCUMENT PROCESSING					

09 MAR 1998

H I O 0.94029807

1

UPGRADABLE ON-SCREEN DISPLAY SYSTEM

This invention relates to the field of digital video recording and in particular to coupling between various equipment components.

- 5 U.S. Patent 5,097,349, issued 17 March 1992 to Pioneer, shows a system in which picture information is recorded as a subcode within audio information. The picture information may subsequently be displayed on an alpha-numeric display or a television display.

10 BACKGROUND OF THE INVENTION

- A digital video signal may be processed to form a bit stream having a reduced bit rate. Such processing for bit rate reduction may be implemented according to an MPEG compression method, and may be formatted, for example, with an MPEG  
15 compatible structure, such as that employed in a digital satellite system, for example DSS™ or the proposed Grand Alliance or GA terrestrial system.

- A consumer video recorder may be adapted to provide recording capabilities for both analog signals and digitally encoded  
20 signals processed for example, for compatibility with an MPEG standard and having GA or DSS™ signal formats. The adapted consumer video recorder may be considered as two electronic systems within one box, sharing a recording mechanism, servo and control systems. A conventional analog recording method may be  
25 employed where an analog luminance signal component frequency modulates an RF carrier and an analog chrominance signal component amplitude modulates a second RF carrier. When reproduced, the two modulated signals are demodulated, combined and coupled out for video display.

- 30 During both record and replay operating modes, on-screen display messages may indicate operational status, warning conditions, tape duration, record time, time code etc., of the video recorder. These on-screen display messages or OSDs may be added to the analog video output signal to provide the user with  
35 recorder status information.

1/1

Digital recording may be achieved by using the consumer video recorder as a digital bit stream recorder/reproducer. The MPEG compatible bit stream, for example transport packets, may be recorded by reformatting the 5 transport packets to facilitate recording and reproduction. For example, the transport packets may be buffered and error detection and correction data words computed and added. The bit stream with error correction added may be formatted into recording data blocks

AMENDED SHEET

- 2 -

or sync blocks containing a predetermined number of bytes which may be accommodated in each recorded track. The sync block signal may be coded to render the signal more suitable for digital recording, for example, to remove any DC component, or provide spectral shaping of the recorded signal, such modulation may be produced by "code book" type encoding. In a playback mode the recording processes are effectively reversed, for example, the "code book" encoding is decoded, errors are detected and corrected and the sync block formatting is removed restoring the bit stream to the original MPEG like format.

To minimize the additional cost increment of digital recording and reproduction, MPEG decoding and encoding is not included in the recorder. Thus the recorder must process the MPEG like packet stream without changes or additions. Hence the recorder provides a program delay or time shifting facility. However, recorder status and warnings and tape timer displays, which during analog operation are added to the analog output signal, may be absent during digital operating modes. Hence, recorder status, etc. may only be ascertained by observation of the recorder control panel.

System interconnection and control between a digital signal source, recorder and monitor display may be simplified by the use of a bi-directional data bus. However, any interconnection additional to that of an analog system may present the user with incomprehensible installation complexity and confusion. A simple interconnection method is required which may provide coupling between a digital signal source and display regardless of a recorder's operational status. The simple interconnection method must facilitate both analog and digital recorder operation by utilizing the same interconnection system. In addition, recorder status and warning messages are required for user display during both analog and digital recorder operating modes.

#### SUMMARY OF THE INVENTION

Recorder status, warnings and tape timer displays which, for reasons described above are absent during digital operating modes are advantageously provided by the following inventive arrangements. A digital television receiver comprises a coupling means adapted for coupling to a replay source and receiving

- 3 -

therefrom a compressed digital television signal and a control command and decoding the compressed digital television signal to form a video signal. A generating means is coupled to the receiving means for generating a display message for combining with said  
5 video signal responsive to display message data. A memory contains the display message data. A control means is coupled to the memory and the generating means for reading the display message data, responsive to the control command.

A digital recording and replay apparatus is adapted for  
10 use with a decoder with on-screen message generator and inserter. The digital recording and replay apparatus comprises a transducer for reproducing a video representative digital signal from a recorded medium. Replay electronics are coupled to the transducer for processing the video representative digital signal to produce an  
15 output signal bit stream for decoding. A status message command signal is generated responsive to an operating mode of the digital recording and replay apparatus. The status message command signal is coupled for on-screen message generation and insertion in a video signal decoded from the output signal bit stream.

A digital television receiver comprises a means adapted  
20 for coupling to a replay source and receiving therefrom a compressed digital television signal, source display message data signal and label data signal. A decoding means is coupled to the receiving means for decoding a video signal from the compressed  
25 digital television signal. A memory stores display message data. A generating means is coupled to the memory and receives therefrom message data for generating a video message for addition to the video signal. A control means is coupled to the memory for selecting specific display message data responsive to the label data  
30 signal, and absent the specific display message data, the control means couples the source display message data signal to the video message generating means.

#### BRIEF DESCRIPTION OF THE DRAWING

FIGURE 1 depicts in block diagram form packetized  
35 signal sources coupled for decoding and display.

FIGURE 2 shows an exemplary block diagram including various inventive embodiments.

- 4 -

FIGURE 3 is an exemplary block diagram showing a simplified switch including various inventive embodiments.

#### DETAILED DESCRIPTION

A simplified consumer digital audio video system is illustrated in FIGURE 1. Sources of packetized, compressed audio video and control data are shown coupled for decoding and display. A receiver, IRD 100 is depicted coupled to a receiving antenna 50, however, a modulated signal may be provided from a cable distribution network (not shown). The modulated packetized signal is tuned, demodulated and a user determined program is separated within the block indicated as PACKET SOURCE 109. An output of PACKET SOURCE 109 comprises a transport packet stream of audio video and control data which is MPEG decoded to produce audio and video signals by DECODER 117. The output from DECODER 117 is coupled for monitoring by display 300. Other sources of packetized signals are shown coupled with a dotted line as alternative data streams for MPEG decoding by decoder 117. Thus DECODER 117 may be utilized to decode transport streams from external packet sources thereby reducing the cost of these other sources. For example, PACKET SOURCE 75 may represent a computer forming a packetized output signal. Such a signal may be derived from a computer memory, or may originate from an external source such as a computer network. Such a computer source may reproduce compressed audio video and control data from disk memory. In addition, PACKET SOURCE 75 may represent a digital video disk player such as, for example, a DVD format device. A further source of transport packets may be provided by a magnetic tape player recorder, PACKET SOURCE 200, which may have a format in accordance with, for example, D-VHS or DVC standards.

A simplified consumer digital video receiver, recorder and display system is illustrated in the exemplary block diagram of FIGURE 2. The system employs a digital video signal source, for example an integrated receiver decoder or IRD 100, an audio video monitor display device 300 and a digital video cassette recorder 200, for example employing a D-VHS or DVC format. In the illustrated system, a digital video representative signal is modulated on an RF carrier and received by an antenna 50. Antenna 50 is coupled to an integrated receiver decoder IRD 100.



- 5 -

However, a modulated carrier may be delivered to receiver 100 by a cable distribution system (not shown). The integrated receiver decoder 100 is tuned to the RF carrier frequency and demodulates therefrom an MPEG compatible transport data stream modulation.

5           The transport data stream may be decoded to produce analog audio and video signals for immediate monitoring by audio video display 300. The decoded output signals are represented by signals 101 and 104, which are coupled between receiver, IRD 100 and display 300. Cost considerations may dictate that digital  
10 recorder 200 does not include MPEG encoding and decoding. Hence digital recorder 200 functions as a bit stream recorder / player, to provide time shifting or program delay capability. The omission of MPEG processing and the degree of complexity required to facilitate non-standard speed replay capability, precludes image  
15 reproduction in SHUTTLE, SLOW MOTION or TRICK-PLAY modes. Thus in summary, receiver 100 couples an MPEG compatible packet stream to digital A/V bus 112 for recording by recorder 200. Similarly a reproduced packet stream from recorder 200 is coupled back to the receiver for MPEG decoding, and audio / video  
20 generation. An additional consequence of omitting MPEG processing from the recorder is that status messages, in the form of on-screen display messages or OSDs, cannot be combined or added to the replay packetized bit stream. Thus the operational status of the recorder is not readily obvious to the user.

25           In addition, since recorder image data is only available during RECORD, PLAY and STOP modes, the user may be uncertain as to the responsiveness of the recorder following control commands. For example, transitioning from PLAY to REWIND may result in the replay image switching for example, to the input bit  
30 stream, a condition known as electronics to electronics or E to E, or for example, the replay image may disappear and be replaced by frozen frame derived by the IRD, or perhaps the moving image may be substituted by a colored field. Thus the user may not readily associate these visual display effects as indicia of recorder mode  
35 responsiveness.

The system illustrated in FIGURE 2, shows a first inventive interconnection arrangement where a demodulated transport bit stream is coupled from receiver IRD 100 to recorder

- 6 -

200 via a bi-directional data bus 112. The transport packet stream is coupled to the data bus via an interface port 110 and is received at recorder 200 by means of interface port 210. The interface ports are controlled via a control data stream which is carried on a  
5 separate conductor included with data bus 112. Control signals may be derived from user input by activation of control switches (not shown), or by user generated IR remote control commands. For example, a user may chose to monitor a digital audio video signal received by dish antenna 50. The receiver may be selected  
10 by touch or via a remote control, for example IR. Receiver selection may result in the automatic monitoring the display selection, i.e. the display is automatically switched to monitor the MPEG decoded audio video outputs. The user may select a digital RECORD mode which results in coupling the received transport stream from IRD  
15 100 via bus 112 to the recorder and initiating recording. Similarly selection of a digital recorder PLAY mode results in a replayed data stream being coupled via bus 112 for decoding by decoder 117 of receiver 100.

The MPEG compatible, packetized signal is coupled to  
20 recorder 200 and processed for recording by block D. REC. 210. A buffer memory is included in block D. REC. 210, and buffers the data stream to establish a signal more suited for recording than the packetized signal comprising bursts of data with variable duration gaps. The buffered data stream is read from the buffer to form  
25 record format sync blocks which may be encoded with error detection / correction data words. The sync block formatted data stream may be modulated for recording as described, and coupled from recording block D. REC. 210 via a selector switch A4. Selector switches A4 and A5 are controlled responsive to the selected D-VCR  
30 operating mode. For example, in FIGURE 2 switches A4 and A5 are shown for digital recording and reproduction, with switch contacts DR, digital record and DP digital playback coupling data streams to and from a rotating head assembly 250. For analog operation, switches A4 and A5 assume the alternate position as indicated by  
35 AR, analog record and AP analog playback. The sync block formatted data stream from D. REC. 210 is coupled to rotating head assembly 250 for recording on a magnetic tape.

- 7 -

In a PLAY mode the recorded sync block formatted data stream is reproduced from the magnetic tape by heads positioned on assembly 250. The recovered signal is demodulated by digital replay block D. Rep. 220, to remove any recording channel modulation. The replay signal is then subject to error detection and correction by means of the data words inserted prior to recording. Following error correction, the sync block formatting is removed and the bit stream restored to have substantially the same the packet format as that coupled to the recorder for recording. The packet stream from block D. Rep. 220 is coupled to interface port 210 which, responsive to the recorder PLAY mode couples the packet stream to the bi-directional data bus 112 for MPEG decoding by decoder 117.

Integrated receiver decoder 100 decodes the MPEG compatible packet stream and generates both video and audio output signals. For example, FIGURE 2 illustrates video and audio output signals 101 and 102 and a component video signal 104, for example S-Video. However, these digitally reproduced video signals are without recorder status information usually provided by means of an on-screen display or OSD.

Receiver IRD 100, shown in simplified form in FIGURE 2, comprises a controller, CTRL. 115, which provides overall control of the receiver, for example tuning, packet header control demultiplexing, bus interface control and selection of packet source for coupling to MPEG decoder 117. In addition the receiver status, or operational mode, may be indicated by means of an on-screen display message added to the decoded video signals. Controller 115 may construct an on-screen display message or may read a predetermined stored message from memory block MEM. 510. The on-screen display message or OSD is coupled to an OSD inserter or adder, block 520 where the message is formatted for analog video display and added or combined with the MPEG decoded video signal. The video with OSD signal is coupled out via output amplifier 118 for display by monitor display 300.

In FIGURE 2 recorder player 200 includes an on-screen display generator, OSD. GEN. 270, coupled to a control system CTRL 205. In response to signals from the recorder control system 205, OSD generator 270 generates status or warning messages

- 8 -

appropriate to the operation condition. These messages are formatted as video signals for insertion or inclusion with an analog video signal in block, OSD. ADD 275. Analog video signals are coupled to the on-screen display adder 275 from a video selector  
5 block SEL. 280.

Selector 280 is controlled by control system 205 and provides selection capability between various analog signal sources. For example, switch A1 provides analog input signal selection between a tuner derived signal, a baseband analog signal input and  
10 an MPEG decoded audio video output signal 102. The output from switch A1 is coupled for analog recording by block A. REC.

Selector switch A3 of SEL 280 advantageously provides selection of signal coupling to on-screen display adder 275. In FIGURE 2 switch A3 is shown providing an inventive coupling of the  
15 video component of output signal 102 to the input of on-screen display adder 275. Thus, recorder player 200 status messages generated, for example during playback, may be added to video signal component 102 decoded from the output transport packet stream. Thus the digitally derived MPEG decoded replay signal  
20 with on-screen messages added, signal 103, may be viewed by display 300.

During analog operation of recorder player 200, switch A3 couples an analog replay signal, shown as signal VHS, to on-screen display adder 275. Thus during analog operation OSD  
25 messages are added to the analog replay video signal. When digital recording is selected, OSD messages may be advantageously added to the analog video signal 102 decoded from the reproduced bit stream. Thus, by means of this advantageous feedback connection recorder status messages are combined with the video component  
30 and output as analog signal 103.

Switch A2 of selector SEL. 280 advantageously provides a connection which bypasses on-screen display adder 275 and allows output signal 102 to be coupled directly to monitor display 300. Thus the bypass action of switch A2 allows viewing of  
35 decoded output signals and removes the possibility of signal degradation due to adder 275. The bypass path A2 may be automatically selected when the recorder is OFF, in a STAND BY mode, or when viewing a decoded, non-recorded "live" bit stream.

- 9 -

To permit viewing of decoded non-recorded signals during analog recording, the bypass switch may be manually activated. The advantageous bypass connection obviates unnecessary analog recorder signal processing, for example via the E/E recorder path which inherently degrades the digitally derived signal 102. In addition the advantageous bypass function may be facilitated, for example by mechanical contact, such that switch A2 allows receiver IRD 100 to be connected to monitor display 300 without regard to the operational status of recorder 200.

On-screen display generator 270 generates messages formatted with specific horizontal and vertical synchronizing timing such that when inserted into the video signal the message is displayed at a predetermined position on the display screen. However, when operating in the digital replay mode and employing the advantageous feedback connection discussed above, OSD messages may be advantageously generated with horizontal and vertical synchronizing timing which is different from that employed during analog recorder operation. This different horizontal and vertical synchronizing timing advantageously compensates for replay signal propagation and MPEG decoding delays encountered, for example, in receiver 100. Thus, the use of different OSD synchronizing timing advantageously achieves substantially the same predetermined message position in either analog or digital recorder operation.

Processing and MPEG decoding time delays may amount to periods of multiple frames. A multiple frame delay, or temporal offset, will result in an OSD message preceding an actual reproduced visual event. This temporal offset, where the recorder OSD message precedes a reproduced event, may be revealed as a consequence of a user control command and the delayed appearance of the corresponding reproduced image effect. The temporal offset may represent a more significant problem when displaying a recorded time code signal or the recorder tape timer. For example, during tape replay specific events may be noted from an on-screen display of the recorder tape timer or an OSD of a recorded time code signal. The noted times allow for subsequent location of the selected events. However, should the noted times be used as edit points for electronic editing performed between recorders, the resultant

- 10 -

edited scenes will precede those selected during previewing. The effect of the temporal offset between the message and the replay image may be advantageously eliminated by a delaying, message generation, message communication, OSD presentation or by

5 modifying the tape timer / time code numbers or count. In recorder 200 a delay, depicted as DLY. 207, may be selected by switches A7 or A8. For example, when decoded video signal 102 is fed back for recorder OSD message insertion at block 275, an OSD message command may be generated responsive to controller 205.

10 The message command signal CMD, from controller 205 is illustrated coupled to switch A7 and delay DLY 207. Switch A7 is controlled responsive to the recording mode selected for recorder 200, i.e. analog or digital. Switch A7 is shown in the digital mode, and selects a delayed version of signal CMD from delay 207. The

15 delayed command signal results in the generation and insertion of an OSD message which is substantially coincident with decoded video signal. An alternative arrangement employs switch A8 which may insert delay 207 into the output from the OSD generator 270. In this arrangement switch A7 is connected to the output of

20 controller 205. Switch A8 may also be employed to delay coupling of signal CMD to bus 112 and IRD 100. The temporal offset between the OSD message and the decoded replay image may also be corrected in receiver 100 by the introduction of a delay, for example as depicted by DLY. 116, into either the memory accessing

25 signal or the memory output signal. Synchronization of replay image and OSD may be achieved by various methods, for example, by means of a delay using a clocked data latch, shift register, monostable multivibrator, etc. A tape timer or time code OSD may be synchronized with the decoded image, for example during edit

30 mode preview by arithmetic manipulation of the display numerals. Thus the selected image and associated display numerals may be entered to enable an electronic edit to be performed. During analog operation of recorder 200 the command signal CMD, from controller 205 is not delayed and switch A7 couples directly to generator 270.

35 In another inventive embodiment, on-screen display messages originated by recorder 200, may advantageously utilize the on-screen display capability of receiver 100. Recorder derived messages may be coupled via the control conductor of data bus 112

- 11 -

to receiver 100 for on-screen display insertion at block OSD 520 of FIGURE 2. The recorder message data may be formatted as a text message by generator 270, to which a tag or label is appended. The tagged text message shown as signal 271 is coupled to controller 5  
115 of IRD 100 for separation from other control bus data. Following separation the text message is coupled for display formatting and video insertion by OSD 520. The text message is generated responsive to OSD command signal CMD from controller 205. As described earlier, signal CMD may be subject to delay at  
10 block 207. However, the text message from block 270 may be delayed at an alternative point by switch A7 insertion of delay 207.

In a further inventive embodiment, receiver 100 includes a memory 510 which contains receiver on-screen display messages and OSD messages specific to recorder 200. Recorder  
15 specific messages may be accessed responsive to recorder on-screen display command signal, CMD, which may be coupled via the control bus to controller 115. In recorder 200 the on-screen display command signal CMD, is generated by controller 205 which in addition determines the message to be generated. Thus command  
20 signal CMD, may be advantageously coupled to receiver 100 to enable accessing and display formatting of recorder specific graphical messages stored in a memory 510.

In yet another inventive arrangement receiver 100 may adaptively select between the recorder text message or a receiver  
25 graphical message responsive to a recorder command. The selection between the recorder text or IRD graphical message display permits the interconnection of recorders and receivers of differing ages having different features and facilities. For example, an older receiver may be connected to a recently manufactured recorder  
30 thus, the receiver memory may not contain preprogrammed graphical messages to support recorder on-screen message presentation. Thus the receiver may display the simple text message generated by the recorder. Conversely, a more modern receiver may be preprogrammed with selections of graphical  
35 messages for a variety of products of various manufactured ages and these various graphical messages may be displayed in place of the recorder text message. Selection between simple text or graphical message is facilitated by the tag or label which is

- 12 -

appended to the text message. For example, the tag or label may contain the command signal CMD which selects, and enables the required recorder specific message. In addition the label may provide sufficient data capacity to communicate recorder profile information relating to, for example, the date of recorder manufacture, model, version or revision level and serial number. When the text message with tag or label is received by controller 115, the tag or label is interpreted which results in the selection of a recorder specific graphical message from IRD memory 510. However, if the receiver memory is not preprogrammed with the specified recorder message or with a message specific to the recorder profile, the tag enables formatting and display of the appended simple text message. As described previously a delay element may be inserted to compensate for temporal and spatial displacement between the OSD message, text or graphical, and the replayed decoded image.

FIGURE 2 illustrates a monitor display 300 having three analog signal inputs; audio video signals 101 and 103, and an audio and component video signal 104, for example, S-video or luminance and coloring components Y, Pr, Pb. In addition, display 300 may receive audio and video signals via radio frequency signals, depicted as RF IN. A signal selector 310, couples as is known, to video and synchronizing processing circuitry, not shown, which in combination generate an image display. Signal selector 310, may be controlled by user activated switches located on display 300, or by user initiated remote control commands transmitted via a modulated IR control stream. The three baseband input signal illustrated may be advantageously selected by automated control of selector switch 310. For example, selection of digital recording or replay modes may automatically select an input signal containing recorder OSD status display information. The recorder status OSD may be generated and originate as previously described. In addition, the provision of multiple baseband signal inputs may allow function specific device interconnection. For example, the direct viewing of a decoded, non-recorded, signal from IRD 100 may be facilitated by use of, for example, output signal 101, or component video signal 103, with IRD output signal 102 routed for recorder OSD insertion to form A/V signal 103.



- 13 -

FIGURE 3 illustrates the use of a reduced cost display, for example, as depicted as display 301. To reduce the display cost the number of signal inputs may be limited to, for example, an RF input, a component video or S-video input and one audio video signal input. The advantageous selection and bypass capability of selector 280 of FIGURE 2, permits display 301 to monitor recorded, and non-recorded material via a single A/V input. However, the display may advantageously utilize the component video signal connection to determine and control the display input selection in addition to signal coupling. For example, since component video signals or S-VIDEO signals may be assumed to provide superior display image quality to that attainable from an NTSC encoded signal, the presence of such component signals coupled to a component signal input may automatically cause selection of the component signal source. Thus when both component and composite signals are coupled to display 301 inputs 1 and 2 respectively, the input controller has logic which predetermines selection of the component signal as a preferred input. However, this automated input selection may prevent monitoring of signals containing recorder specific on-screen display information coupled from recorder 200 of FIGURE 2. However, the automated, preferential input selection may be advantageously utilized to enable remotely controlled selection of the audio video signal, for example signal 103 at input 2. Signals containing on-screen display information coupled via recorder 200 may be viewed on display 301 by an inventive control of component signal 104 by means of allowing or terminating output coupling signal 104 from IRD 100. For example, user selection of a non-recorded bit stream, i.e. received signal, will result in controller 115 of receiver 100 enabling generation or outputting of component signal 104, having for example, an S-VIDEO format. The selection of a recorded image signal for display will result in controller 115 terminating generation, or outputting of component signal 104. Thus controller 312 of monitor 301 is coupled to the component signal input terminal to senses via signal 309 the absence of signal 104 and causes input selector 311 to switch from the component input signal 104, on input 1 to, for example, audio video signal 103, on input 2 coupled via selector 280 of recorder 200 in FIGURE 2.

## CLAIMS

1. A digital recording and replay apparatus (200) with  
5 on-screen message generator and inserter (520), said digital  
recording and replay apparatus comprising:

a transducer (251) for reproducing a video representative  
digital signal from a recorded medium;

10 replay electronics (220) coupled to said transducer (251) for  
processing said video representative digital signal to produce an  
output signal bit stream (221);

a decoder (117) having an input coupled to said replay  
electronics (220) and an output which produces a video signal;

15 an operating mode of said digital recording and replay apparatus  
(200), for generating a status message signal (TAG/CMD); and

means for inserting said status message signal into the video  
signal (102) decoded from said output signal bit stream (221).

20 2. The digital recording and replay apparatus (200) of  
claim 1, wherein said status message signal (TAG/CMD) indicates  
an apparatus specific message.

3. The digital recording and replay apparatus (200) of  
25 claim 1, wherein said status message signal (TAG/CMD) indicates  
apparatus specific data.

4. A digital television receiver (100), comprising:  
receiving means (110) having a first input coupled to a  
30 replay source and receiving therefrom a compressed digital  
television signal, and a second input coupled to a control signal,  
said receiving means decoding said compressed digital television  
signal to form a video signal (102);

means (520) coupled to said receiving means (110) for  
35 generating a display message responsive to display message data

15

and for combining said display message with said video signal (102);

a memory (510) containing said display message data;  
control means (115) coupled to said memory (510) and said  
5 generating means (520) for reading said display message data  
from said memory, responsive to said control command.

5. The digital television receiver (100) of claim 4,  
wherein said memory (510) contains display message data specific  
10 to a plurality of television signal sources.

6. The digital television receiver (100) of claim 4,  
wherein said memory (510) contains display message data specific  
to said digital television receiver (100) and a plurality of  
15 television signal replay sources.

7. The digital television receiver (100) of claim 4,  
wherein said memory (510) contains display message data specific  
to a digital recording and replay apparatus.  
20 . . . . .

8. The digital television receiver (100) of claim 5,  
wherein said control means (115) selects a specific display  
message responsive to said control command.

25 9. A digital television receiver (100), comprising:  
receiving means (110) coupled to a replay source and  
receiving therefrom a compressed digital television signal, said  
receiving means also receiving a source display message data  
signal and a label data signal;  
30 decoding means (117) coupled to said receiving means (110)  
for producing a video signal (102) from said compressed digital  
television signal;  
a memory (510) storing display message data;  
video message generating means (520) coupled to said  
35 memory (510) and receiving therefrom message data for

16

generating a video message, and for adding said video message to said video signal (102); and,

control means (115) coupled to said memory (510) for selecting specific display message data responsive to said label  
5 data signal and, absent said specific display message data, coupling said source display message data signal to said video message generating means (520).

10. The digital television receiver (100) of claim 9,  
10 wherein said memory (510) contains display message data specific to said digital television receiver (100) and a plurality of television signal replay sources.

AMENDED SHEET

1/2

FIG. 1

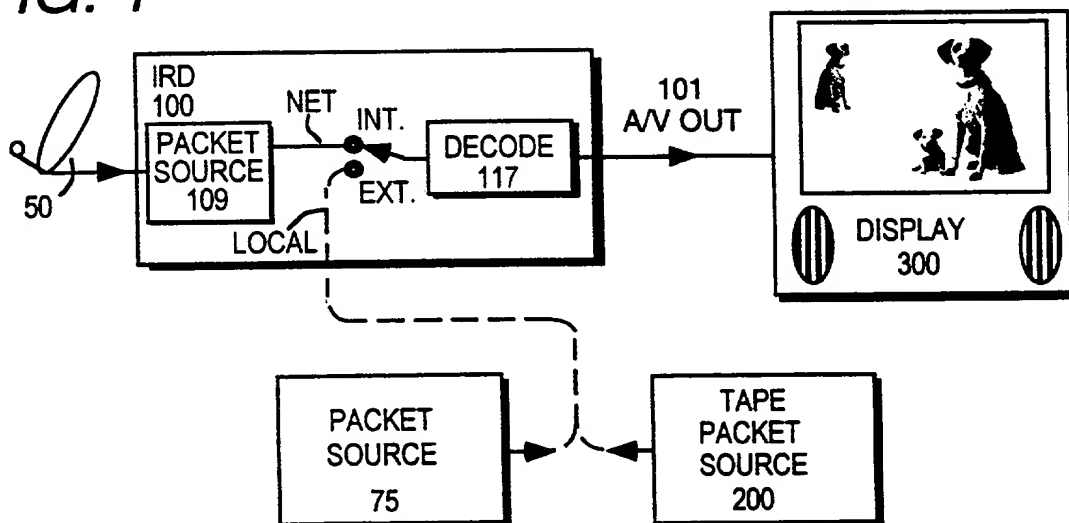
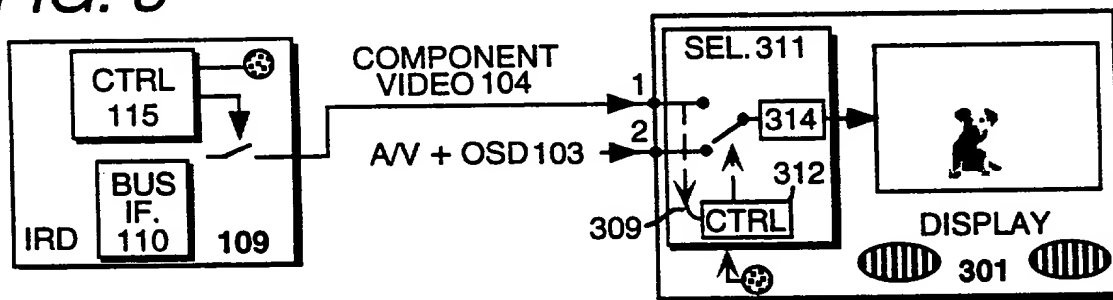
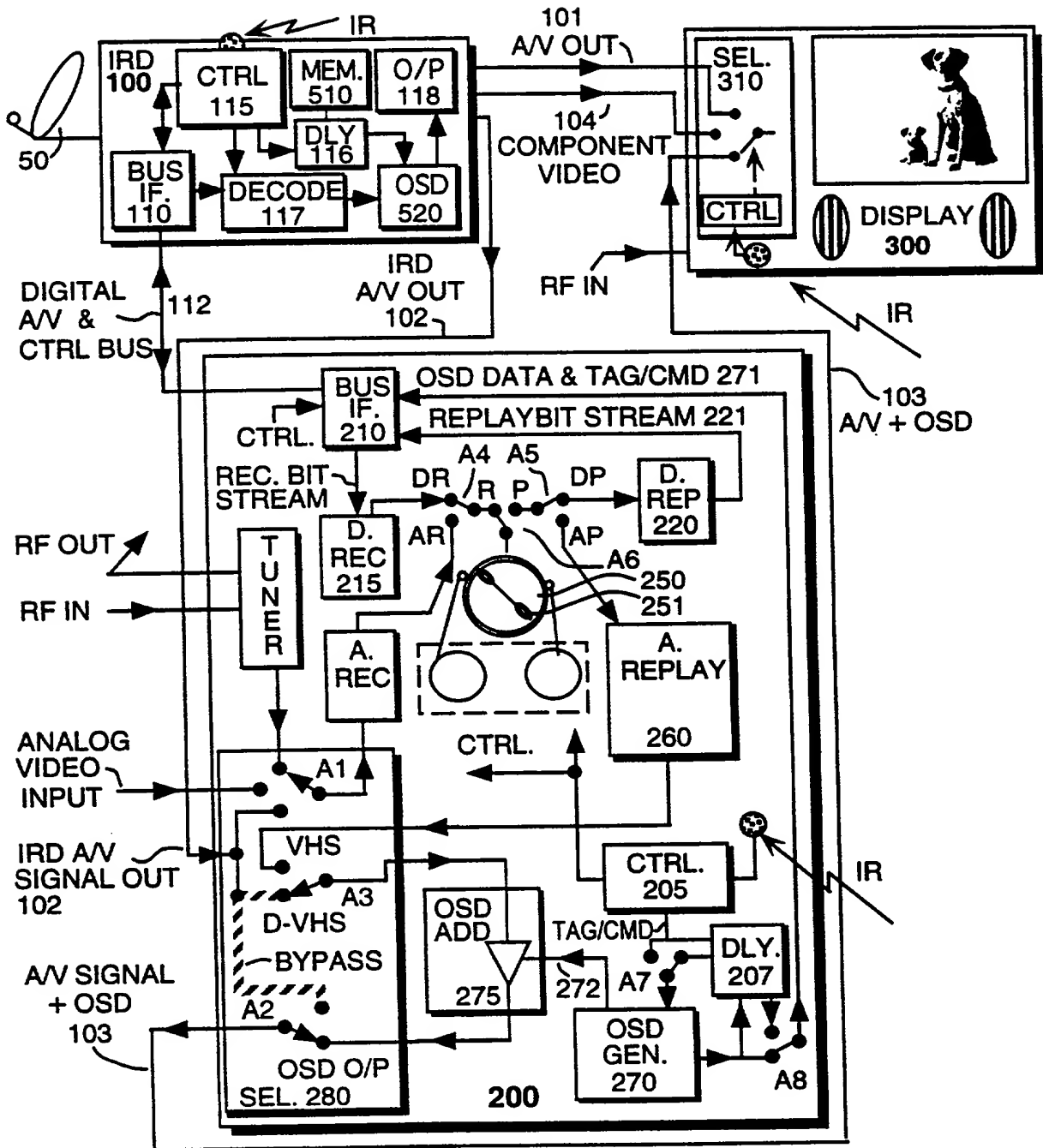


FIG. 3



2/2

FIG. 2



09/029814  
Combined Declaration For Patent Application and Power of Attorney (Continued)  
(Includes Reference to PCT International Applications)

ATTORNEY'S DOCKET NUMBER  
RCA 88391

Filed PCT 29 MAY 1998

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C 120:

U.S. APPLICATIONS		STATUS (Check one)		
U.S. APPLICATION NUMBER	U.S. FILING DATE	PATENTED	PENDING	ABANDONED
60/003834	14 February 1996			
PCT APPLICATIONS DESIGNATING THE U.S.				
PCT APPLICATION NO	PCT FILING DATE	U.S. SERIAL NUMBERS ASSIGNED (if any)		
PCT/US96/14733	13 September 1996	13.09.96)	X	

4  
POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (List name and registration number)

Joseph S. Tripoli	- Reg. No. 26,040
Joseph J. Laks	- Reg. No. 27,914
Francis A. Davenport	- Reg. No. 36,316
Daniel E. Sragow	- Reg. No. 22,856

Send Correspondence to:

Mr. Joseph S. Tripoli - Patent Operations  
GE & RCA Licensing Management Operation, Inc.  
PO Box 5312  
Princeton, New Jersey 08543 US

Direct Telephone Calls to:  
(name and telephone number)

1-609-734-9864

201	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
		BLATTER	Harold	
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
		Indianapolis IN	Indiana	US
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY
		2220 Brewster Road	Indianapolis	Indiana 46260 US
202	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
		KVINTUS JR.	Michael	Francis
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
		Terre Haute IN	Indiana	US
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY
		4234 South Willow Brook Court	Terre Haute	Indiana 47802 US
203	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
		McLANE	Michael	Joseph
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
		720 Sherwood Drive	Indianapolis IN	Indiana 46240 US
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF INVENTOR 201

Harold Blatter

DATE

5/26/98

1998

SIGNATURE OF INVENTOR 202

Michael Francis Kvintus, Jr.

DATE

5/15

1998

SIGNATURE OF INVENTOR 203

Michael Joseph McLane

DATE

MAY 26,

1998

**COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY**

(Includes Reference to PCT international Applications)

ATTORNEY'S DOCKET NUMBER

RCA 88391

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

UPGRADABLE ON-SCREEN DISPLAY SYSTEM

the specification of which (check only one item below):

☐ is attached hereto.

☐ was filed as United States application

Serial No. \_\_\_\_\_

on \_\_\_\_\_,

and was amended

on \_\_\_\_\_ (if applicable).

☒ was filed as PCT international application

Number PCT/US96/14733

on 13 September 1996,

and was amended under PCT Article ~~XX~~ 34

on 10 October 1997 (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

**PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:**

COUNTRY (if PCT, indicate "PCT")	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 USC 119
GB	9603332.9	15 September 1995	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO